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Ballard, Smithson, and the Biophilosophy of the Crystal

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1. Landscapes of Spatiotemporal Crisis

How should ecocriticism proceed when considering the apocalyptic landscapes of Ballard's early tetralogy? *The Wind from Nowhere* (1962), *The Drowned World* (1962), *The Drought* (1964), and *The Crystal World* (1966) provide scenarios in which small groups of survivors struggle to adapt to radical and destructive environmental changes. While we can position these novels broadly within the disaster tradition of British science fiction as represented by John Wyndham, John Christopher and others, they stand apart from this field by featuring characters who accept their fate with unusual resignation, almost apathy. Ballard's language often reflects the cold detachment of scientific discourse, but no technological fixes emerge in these narratives to resolve the respective ecological crises of devastating winds, melting icecaps, desertification, and the crystallisation of matter. Whatever heroism Ballard's protagonists possess is to be found in their willingness to embrace the challenges posed by the catastrophe and attain a state of mind adequate to it.

The dominant trend in scholarship (Pringle 1984; Luckhurst 1997; Francis 2011) has been to follow Ballard's own lead and to regard these landscapes as symbolic manifestations of psychological states or external realisations of 'inner space', but an ecocritical analysis cannot be satisfied with this. Indeed, it is increasingly difficult *not* to read these works ecologically and materially and in relation to our own climate emergency. An alternative trend has thus emerged in recent years showing an eagerness to attribute to Ballard a prescience with respect to

concerns about environmental change. Amitav Ghosh (2016), for example, insists that Ballard was ‘one of the very few’ literary minds of the latter half of the 20th century ‘alive to the archaic voice whose rumblings, once familiar, had now become inaudible to humanity: that of the earth and its atmosphere’ (124). Adam Trexler’s *Anthropocene Fictions* (2015) and a number of recent articles similarly regard the early novels as precursors, even progenitors, of climate fiction, a burgeoning category that has emerged in the last ten to fifteen years at the intersection of SF with mainstream popular and literary fiction (for a comprehensive survey see Johns-Putra 2016). Adrian Tait argues that, ‘like the quartet of which it forms a part, the images conjured up in *The Drowned World* anticipate concerns that only years later formed themselves into a global discourse of environmental anxiety; this is “cli-fi” before climate change was understood’ (2014, 30). Jim Clarke is more sceptical about such anachronistic co-option, but nonetheless maintains that Ballard’s accounts of ecological collapse ‘transcend literature’ to provide iconic signifiers of climate crisis *avant la lettre* (2013, 20).

The problem is that these readings risk placing Ballard within a 21st century environmentalist discourse that is, in fact, quite alien to his work’s real concerns and achievements. His ecoapocalyptic visions are strikingly *indifferent* to what we would recognise as a green awareness of the human impact on nature. Only one of the disasters described in the tetralogy—the one from *The Drought*—is anthropogenic. But even in that text, in which rainfall ceases due to industrial waste deposited in the oceans, the ethico-political issues surrounding human culpability and survival are ignored almost entirely. Instead, the desertification of the Earth is seen as a precursor to a more profound, if inscrutable, future. The rising global temperatures behind the deluges of *The Drowned World*, meanwhile, are attributed to freak solar storms and

the resulting climatic changes in which London comes to resemble a tropical jungle are grasped in terms of a regression of conscious life to its evolutionary, 'archaeopsychic' past (Ballard 2012b, 57). In the end, Ballard's apocalypses are not prescient warnings about the impact of humanity on the biosphere but visionary and strangely gratifying *solutions* to conflicts between the organic and the technological, nature and society, matter and form. As Gregory Stephenson (1991) puts it in one of the earliest book length studies of Ballard, the elemental catastrophes of air, water, fire and earth are, like the subsequent visions of the traffic accident as sexual release in *Crash* (1973), 'deeply desired by the unconscious' (73).

The challenge for contemporary criticism, then, is to navigate a path between the psychological and the environmental when it comes to understanding Ballard's ecoapocalyptic texts. For Ballard himself, the role of landscape in fiction is related to a knotting together of the inner and the outer. He regarded his landscapes, like those of his great influences Dali and Ernst, as 'formalisation[s] of space and time' (Ballard 2012a, 5). Space and time, Ballard suggests, aren't mere external givens but resources, internally accessible potentialities that can be drawn on creatively through art (as through architecture and technology). If remaking space and time involves a catastrophic moment, then for Ballard's era this was symbolised most emphatically by the atom bomb. The equivalent for us today is climate change. Nevertheless, the promise of a new spacetime retains a distinct utopianism for Ballard. The ecological transformations of the early novels are means of exploring the apocalyptic rupture implied in the construction of new spacetimes. Architecture and the visual art of landscape remained touchstones for Ballard because they can suggest new ways of allowing us to see and inhabit the world. At the same time, the older ways must dissolve, leading to a moment of crisis in which perception and action become subject

to a strange stasis and the stakes of life and survival are suspended. A visionary attitude comes to dominate over action in Ballard's apocalyptic texts, but this is a seeing in which what is witnessed is a transformation of space and time as the very conditions of perception itself. This is where a green reading of Ballard becomes inadequate. Jeffrey Jerome Cohen has defined green readings and their limitations in the following way:

green readings have a tendency to reproduce ... a split between nature and culture that founds a structuring antinomy even in the face of constitutive and intractable hybridities. Assuming such a split can lead to analyses stressing anthropocentric and detached concepts like stewardship, preservation, and prescriptive modes of environmental management. (Cohen 2013, xx)

Ballard's ecocatastrophes deal precisely with the *loss* of the nature/culture distinction and with the unconsciously desired *unravelling* of that distinction as a structuring antinomy. This plays out less as an awareness of the mutual interactions of human and non-human agencies than a transformation of the human itself through the medium of ecological crisis. To this extent, Ballard retains an anthropocentrism, but one fully invested in an apocalyptic transition beyond the antinomies of culture and nature, organic and inorganic, etc. He is, likewise, less interested in the outcomes of such a transition than in the processes propelling us towards it.

In this article, I pursue a non-green reading of *The Crystal World* as a narrative of spatiotemporal crisis and ecoaesthetic apocalypse. I read the novel alongside the American artist Robert Smithson, whose work suggests a number of

important parallels with Ballard. Existing discussions of Ballard's links with Smithson are curiously silent on their mutual fascination with the crystal, which becomes prominent as a guiding motif in Smithson's work from the mid-60s until his death in 1972. Smithson's article 'The Crystal Land' (1966) in particular suggests the influence of Ballard's novel. Nevertheless, the influence went both ways, and while Ballard returned again and again to the Surrealist painters, Smithson was probably the visual artist closest to his work's achievements. In both his art works and his writings, Smithson like Ballard used experimental landscapes to pursue new forms of space and time in ways that collapse distinctions between organic and inorganic, and natural and built environments.

The catastrophe of crystallisation is undoubtedly the strangest of Ballard's ecoapocalyptic tetralogy and the one in which the knotting of inner and outer space is pushed to its limit. The crystallisation process, originating in deep space, initially affects vegetation—and is thus thought to be some form of plant disease—but soon spreads to animals, people, and ultimately all matter. The process is detected as having overrun entire galaxies and is named the 'Hubble Effect' by the astronomers who first observe it. As in *The Drowned World* and *The Drought*, the narrative's detailed descriptions of the landscape are interrupted by bursts of activity that drive the plot forward. Nevertheless, the task of survival is ultimately overwhelmed by the mysterious allure that the transformed environment exerts on Ballard's characters. Unlike the prior books in the tetralogy, however, the nature of the catastrophic process is central to Ballard's aesthetic concerns. While wind, deluge and desertification are mere occasions to reveal a dangerously transformed Earth, crystallisation springs directly from a new formalisation of space and time resulting from the appearance of what Ballard calls 'anti-time'—a concept modelled on anti-

matter—which causes time to leak out of the universe. Matter is subsequently supersaturated and ‘effloresces’, creating duplicate images of itself at the sub-atomic level in order to compensate for the lost quanta of time. Crystallisation thus sees the emergence of matter without temporal duration or durability, ‘substance without mass’, as Sanders, Ballard’s doctor protagonist, puts it in a letter to a colleague:

Just as a super-saturated solution will discharge itself into a crystalline mass, so the super-saturation of matter in our continuum leads to its appearance in a parallel spatial matrix. As more and more time “leaks” away, the process of super-saturation continues, the original atoms and molecules producing spatial replicas of themselves, substance without mass, in an attempt to increase their foot-hold upon existence. The process is theoretically without end, and it may be possible eventually for a single atom to produce an infinite number of duplicates of itself and so fill the entire universe. (Ballard 2011, 85)

Crystallisation, then, is the proliferation of matter as pure image. Another character, also a doctor, describes the process as a kind of cancerous growth: ‘It’s as if a sequence of displaced but identical images of the same object were being produced by refraction through a prism, but with the element of time replacing the role of light’ (66). Sanders compares the crystallisation process to the viral propagation of leprosy and the crystalline nature of the virus itself (84). To the extent that Ballard’s narrative subordinates plot and character to a series of obsessively multiplied images of the catastrophe, the writing itself *mirrors the crystallisation it describes*. Just as the crystal grows through a reduplication of matter, the narrative progresses via the kinds of doubling and reflection created by the attempts of Ballard’s characters to interpret

the signs of the crystal world they inhabit. The catastrophe, then, is both a material process *and* the loss of a stable material referent by which to pinpoint it. The crystal forest in which Sanders finds himself is a ‘forest of signs’ in which cultural, historical and psychological images metastasise in an unknown ecology. As Luckhurst (1997) has put it, ‘the crystallizing virus in the forest seems to attack reference itself’ (59). Crystallisation is, in other words, a material ecological event *and* a psychologically catastrophic loss of meaning to images spreading virally through the text.

Existing readings of the novel by Pringle, Stephenson, Luckhurst, and Francis are dominated by Jungian and existential approaches by which the crystal is seen as a symbol of the individuation of the self. Gasiorek (2005), meanwhile, reads the novel, which references Wordsworth and Shelley, in the tradition of the Romantic sublime and insists on the crystal as a means of quasi-religious transcendence. Baxter (2009) insists on the novel as a postcolonial text inspired by the anti-imperialist politics of Surrealism. In all of these analyses, the material process of crystallisation as described by the sciences is more or less totally side-lined in favour of the crystal’s symbolic value. While I refer to physics, biology, and crystallography, my main theoretical reference points are the French biophilosophical tradition of Bergson, Simondon and Deleuze. The latter two use the crystal as a way of thinking about life that does not privilege the organic at the expense of the inorganic. Deleuze, in his work on cinema, combines Bergson and Simondon to develop notions of the ‘crystal image’ and ‘crystalline narration’, which are deployed in my reading of *The Crystal World* in the final section. The biophilosophy of the crystal that Deleuze takes from Simondon enables him to theorise an aesthetics of spatiotemporal crisis. While Simondon offers what we might call a general ecology through the framework of the crystal, Deleuze extends this to analyses of perception, sensation, affect and images.

2. Ballard, Smithson, and the Question of Entropy

Ballard's links to visual art and architecture are well known, but his relationship to Robert Smithson deserves more scrutiny. For one thing, Smithson's extensive theoretical writings can help to illuminate the role of the built and natural environment in Ballard's work. Smithson's signature piece, *Spiral Jetty* (1970), is a 1500-foot-long spiral strip constructed from black basalt at a remote point on the banks of the Great Salt Lake in Utah. It is generally seen as a key representative of land art, a movement that emerged out of minimalism and conceptualism in the 1960s. In an essay on *Spiral Jetty* Smithson writes, in a language evocative of Ballard's concern with the 'archeopsychic', that the site in Utah suggested the contemporaneousness of the deep past:

An expanse of salt flats bordered the lake, and caught in its sediments were countless bits of wreckage. Old piers were left high and dry. The mere sight of the trapped fragments of junk and waste transported one into a world of modern prehistory. The products of a Devonian industry, the remains of a Silurian technology, all the machines of the Upper Carboniferous Period were lost in those expansive deposits of sand and mud. (Smithson 1996, 146)

Smithson goes on to describe the jetty's spiral tail as leading 'into an undifferentiated state of matter' (147). The work is a kind of time machine leading into the solvent of a primordial fluid: 'Following the spiral steps we return to our origins, back to some

pulpy protoplasm' (148). The theme here is that of *The Drowned World* but also Ballard's key early short story 'The Voices of Time' (1960), which Smithson mentions explicitly (343). In this text, Ballard is concerned with both biological de-evolution and a sense of cosmic end time. Powers, a neurosurgeon, is struggling to understand an epidemic of narcolepsy while reviewing the work of his biologist colleague Whitby on genetic mutations linked to evolutionary regression. Kaldren, a former patient of Powers, occupies a large spiral-shaped house, built to model the square root of minus one, where he exhibits what he calls 'Terminal Documents', artefacts of modern society from the works of Beethoven and Freud to transcripts of the Nuremburg Trials. Kaldren picks up radio signals from the spiral galaxies of Canes Ventici that he interprets as a countdown to the end of the universe. As he tells Powers:

The big spirals there are breaking up, and they're saying goodbye ... These are the voices of time, and they're all saying goodbye to you. Think of yourself in a wider context. Every particle in your body, every grain of sand, every galaxy carries the same signature. (Ballard 2001, 256).

Spiral Jetty, then, can be interpreted as what Smithson calls an 'entropic landscape' reflecting a Ballardian concern with problems of time, modernity, and degradation. In his essay 'Entropy and the New Monuments' (1966), Smithson describes the work of major minimalist sculptors such as Donald Judd and Dan Flavin as redolent of science fiction architectures and as providing 'a visual analog for the Second Law of Thermodynamics' (11). Entropy, here, is to be understood as the tendency towards increasing disorder and the loss of available energy, the outcome of which is a state of

undifferentiated matter. Such a view of time runs counter to narratives of progress and evolution. The monumental sculpture of Judd, Flavin and others ‘are not built for the ages, but against the ages’ (11). Rather than suggesting the stages of human history, they suggest the manifestation in the present of a kind of eternity that is not spiritual but monumental: ‘past and future are placed into an objective present. This kind of time has little or no space; it is stationary and without movement, it is going nowhere, it is anti-Newtonian ... time becomes place minus motion’ (11). A radical new spatiotemporal condition is suggested by the new monuments of minimalist sculpture, one that is resolutely non-biological and non-organic: ‘Time as decay or biological evolution is eliminated by many of these artists’ (11).

Existing accounts of the links between Smithson and Ballard (Finklestein 1987 and Tsai 1988) focus on their concern with entropy but ignore the conception of an inorganic spacetime that Smithson sees in the art of the 60s. As Ballard himself wrote, ‘Smithson’s monuments ... [are] artefacts intended to serve as machines that will suddenly switch themselves on and begin to generate a more complex time and space’ (1997, 31). Fredric Jameson, in his reading of ‘The Voices of Time’, suggests that Ballard’s spiral constructs and notions of cosmic decline were indicative of a general shift towards the postmodern across the arts by which spatiality began to take precedence over older views of temporality and history:

Ballard’s pathos of entropy is ... the *affect* released by the minute, and not unenthusiastic, exploration of this whole new world of spatiality, and the sharp pang of the death of the modern that accompanies it. At any rate, from this nostalgic and regressive perspective—that of the older modern and its temporalities—what is mourned is the memory of deep memory; what is

enacted is a nostalgia for nostalgia, for the grand older extinct questions of origin and telos, of deep time and the Freudian Unconscious. (1991, 156)

Entropy here is seen as indicative of a loss of time as available energy, memory, continuity, possibility, novelty, and historical development, all of which give way to the spatial condition of postmodernity and instantaneous consumer capitalism. A concern with deep time, of the kind we see in Smithson and Ballard, is only the ideological manifestation of the loss of a sense of historical reality. In this way, Jameson ultimately deflates Ballard's apocalyptic vision and reads his disaster narratives as meditations on the end of the British Empire (Jameson 2005, 288).

We can agree with Jameson that the role of entropy in Ballard and others signals a new concern with spatiality and a break with older models of time. But Jameson's conceptions of ideology and history prevent him from taking seriously Ballard's utopian claim, inspired by Smithson's work, that art can be a machine for producing new spacetimes. It is thus possible to read the role of entropy in Smithson and Ballard quite differently than Jameson does, and in a more positive and utopian sense than is generally done. Art and literature are capable of fabricating new sets of spatiotemporal conditions of perception that break with historical continuity. This does not necessarily entail the loss of the grand temporal questions of the 19th and early 20th century but a transformation of them beyond the organic model of time. For Smithson, entropy signals the end of 'organic time' but, crucially, also grants access to an inorganic time beyond what he calls the 'biological metaphor', by which he means the tendency to view all action in terms of 'the "useful" time of organic (active) duration' (35). The biological metaphor distorts our understanding of our relationship with the environment by imposing a vitalistic evolutionary framework:

‘biological science has since the nineteenth century infused in most people’s minds an unconscious faith in “creative evolution”. An intelligible dissatisfaction with this faith is very much in evidence in the work of certain artists’ (35-6). Smithson’s use of geological landscapes and inorganic materials, most notably crystals, are the main ways he achieves a break from organic time in his art. Installation pieces such as *Non-Sites* (1968) present gravel and rubble taken from New Jersey stone quarries, mines and derelict zones accompanied by maps and photographs. *Untitled* (1964-65), a crystal-shaped steel and Plexiglas sculpture with blue faces and a pink frame, is one of a number of sculptural works that explore space and light through crystalline and prismatic forms. The painted steel and chrome modules of *Cryosphere* (1966) are hexagonal lattices inspired by ice crystals (Smithson 1996, 197).

Smithson’s reading of crystallography texts such as Charles Bunn’s *Crystals: Their Role in Nature and Science* (1964) was key to the development of his work because it offered an inorganic model for thinking the accumulation of form (Roberts 2004, 40). Crystals ‘grow’, but through a relatively autonomous accretion of layers that is susceptible to changes or ‘dislocations’. One example of this, the ‘screw dislocation’, gives rise to spiral structures. As Bunn writes:

Molecules readily add onto the edges of layers, and if this happens on the edge of the step formed by a screw dislocation, it can go on happening indefinitely; the layer is never completed, and the crystal, so to speak, grows ‘up a spiral staircase’. (45)

Growth here is molecular rather than molar, following additions or layers that are always incomplete and indefinite and that proceed from the edges rather than from a

centre. *Spiral Jetty* appears inspired by this model of crystal growth in which each layer is added fractally to the one adjacent to it. Smithson writes of the salt crystals in the lake:

each cubic salt crystal echoes the Spiral Jetty in terms of the crystal's molecular lattice. Growth in a crystal advances around a dislocation point, in the manner of a screw. The Spiral Jetty could be considered one layer within the spiraling crystal lattice, magnified trillions of times. (147)

The crystal's molecular growth implicates different orders of scale in a way that 'dislocates' the centrality of an observer in a landscape.

Smithson's text 'The Crystal Land' (1966) suggests the necessity to move beyond the confines of the gallery space and to work directly in the environment, but it also collapses the natural and the cultural, the organic and inorganic, into one another. The piece describes a trip to a New Jersey stone quarry with Judd, who shared an enthusiasm for geology and mineralogy. The mineral forms that Judd's sculptures call to mind suggest the contours of an arid, cracked, bleached and fragmented landscape, a place in which organic time has been used up and is giving way to something else. In a moment of subdued apocalypticism, the motorways, middle-income homes, and diners come to manifest the same crystalline quality (8). If, as W.J.T. Mitchell (1994) puts it, landscape as an aesthetic category has traditionally been 'a medium of exchange between the human and the natural, the self and the other', then the crystal land presents these oppositions as exhausted and susceptible to the kinds of derangement of scale at work in *Spiral Jetty* (Mitchell, 5).

Something similar happens in Ballard's novel: the crystal motif extends from the level of the virus to the forest to cosmic dimensions.

3. The Crystal and Inorganic Life

The crystal has played a significant role in 20th century art history. It has featured as a key motif in Breton's account of Surrealism (Breton 1978, 162-3), in Bauhaus architecture (Taylor 1992, 121), and in Wilhelm Worringer's influential art historical text *Abstraction and Empathy* (1908). Writing on the role of the crystal in art and philosophy, Mark Cheetham (2013) observes that 'crystals are compelling because they are indexical of existential questions, poised at the crossing of life and death. While their perfect forms appear lifeless, they suggest life because they "grow" and move' (251). In the sciences, meanwhile, the crystal has been of singular importance for 20th century understandings of life, and in particular for interrogating the border between the organic and the inorganic. Ernst Haeckel—the German scientist and artist who coined the term 'ecology'—published *Crystal Souls: Studies in Inorganic Life* in 1917. Haeckel's book, inspired by the discovery by Otto Lehmann of liquid crystals 13 years earlier, articulated a biophilosophy of inorganic matter. As Spyros Papapetros (2016) writes, for Haeckel 'since liquid crystals exhibited signs of irritability and movement, it meant they had a soul—a crystal soul—and since they had a soul, they were also living' (87). Such a conclusion leads beyond science to a philosophical vision of all matter as actually or potentially living: for Haeckel, Papapetros continues, 'all matter had force and energy. In the organic, this force was active; in the inorganic, it was latent yet potent, and much more potent, in fact, than what we call living' (87).

Erwin Schrödinger in *What is Life?* (1944), anticipating somewhat the discoveries of Crick and Watson, described the chromosome as an ‘aperiodic solid’, that is, a molecule with the solidity of crystal but with the capacity to break the ‘periodic’ regularity of crystalline structures. The chromosome’s molecular code is formed from simple repeating patterns like a crystal’s, even though the resulting diversity of biological life is anything but simple or repetitive. The organism is thus *like* a crystal, were crystals less ‘plain and dull’. The difference between crystals and organisms is the difference between ‘ordinary wallpaper in which the same pattern is repeated again and again in regular periodicity and a masterpiece of embroidery, say a Raphael tapestry’ (Schrödinger 1992, 5). Schrödinger’s reference to art obfuscates more than it clarifies. Are crystals like organisms or are organisms like crystals? For Schrödinger, it would appear to be the latter: organisms are like crystals in that they have a durable consistency of structure (or symmetry) that seems to resist the entropic tendency to disorder. But simultaneously, crystals are *unlike* organisms in the same way that a piece of boring wallpaper is, precisely because of this same degree of ordered regularity, unlike a Raphael tapestry. A recourse to aesthetic judgment is required by Schrödinger to deny the possibility of inorganic life that the crystal suggests.

If we look to the work of French philosopher Gilbert Simondon, we find the analogy of the crystal applied to biological life but in an entirely inverse fashion. Simondon’s book *L’Individu et sa genèse physico-biologique* (1964) provides a theory of what he calls the ‘individuation’ of living beings in a way that does not judge the inorganic against the organic but rather gives an account of ontogenesis capable of explaining—instead of presupposing—the differences between organic and inorganic beings. His theory of individuation is part of a French biophilosophical

tradition associated with Henri Bergson in the first half of the 20th century and Gilles Deleuze in the latter half. Bergson's *Creative Evolution* (1907)—hugely popular in its day—challenged the Darwinian model of evolution by arguing for the existence of an 'élan vital' or vital principle by which life not only adapts to its environment but is propelled creatively through its diverse forms. Despite Simondon's debts to Bergson, he departs from the latter's vitalism, which tends towards mysticism in its account of life as a creative force irreducible to matter. From a Simondonian perspective, Bergson's creative evolutionism fails to escape from a certain conception, dating back to Aristotle's *De Anima*, of life as a conjunction of indeterminate, non-living matter (*hyle*) and a determining, animating form (Ansell-Pearson 1999). This 'hylomorphic' view is critiqued by Simondon because it denies the possibility of matter self-organising contingently and for beings to come into being—to *become*—according to dynamics latent within matter itself. Instead of relating an already-constituted individual being back to some prior schema (such as the hylomorphic conjunction of matter and form or a genetic code), we should view beings as self-constituting and indissociable from their becoming or individuation in a wider environment of transindividuation.

Simondon's favoured example of how individuation works is the formation of crystals, and it is in this respect that he offers an account of the relationship between crystals and organisms that is the inverse of Schrodinger's. For the latter, the chromosome's code contains 'the entire pattern of the individual's future development' just as a crystal is formed from a small number of repeating configurations (Schrodinger 1992, 21). For Simondon, however, the crystal provides a paradigm for thinking organic life precisely because beings become in a way that is *not* determined in advance. His ontology of the genesis of individual beings (organic

or inorganic) emphasises individuation as a process of becoming that is not preformed.

There is, in reality, no such thing as a *fully* constituted or realised individual since individuation involves contingent, on-going actualisations of potentials. These potentials constitute what Simondon calls a ‘preindividual state’ or field which accompanies individuals as their potentiality: ‘individuation does not exhaust in the single act of its appearance all the potentials embedded in the preindividual state’ (Simondon 1992, 300). The preindividual *coexists with the individual as its condition*. The formation of crystals offers Simondon one of his key recurring examples of individuation in this sense. Crystals form out of a disturbance in what are known as ‘supersaturated’ solutions. Supersaturated solutions are both amorphous and unstable and the crystal forms as a partial resolution to this instability. This process involves an entropic tendency towards equilibrium, but the crystal can be regarded as being in a *metastable* (as opposed to stable) equilibrium as long as it continues to individuate. Just as a crystal precipitates from an unstable solution, so an individual forms a metastable (partial) resolution of a preindividual field. All individuations, then, occur at a limit point between relative internal and external domains:

the crystal’s genesis ... would allow us to grasp, on the macroscopic level, a phenomenon that is rooted in those states of the system belonging to the microphysical domain, molecular and not molar. It would manage to grasp that activity which is at the very boundary of the crystal in the process of formation. Such an individuation is not to be thought of as the meeting of a previous form and matter existing as already constituted and separate terms, but a resolution taking place in the heart of a metastable system rich in

potentials: *form, matter and energy pre-exist in the system*. ... At the same time that a quantity of energy ... is actualized, a portion of matter is organized. (Simondon 1992, 304)

Form, matter, and energy pre-exist but in a particular way: not as a pattern to be realised but as a potential or (as Deleuze would say, following Bergson) a *virtual* condition for the individual's actualisation in contingent encounters. This is the case with a crystal, which develops at the frontier between its surfaces and the solution: 'beginning as a tiny seed, [a crystal] grows and extends itself in all directions in its mother-water. Each layer of molecules that has been constituted serves as the structuring basis for the layer that is being formed next' (313). This manner of accreting form, which Simondon calls 'transduction', involves a progressive iteration in which every actualisation forms a new condition for subsequent ones. New conditions are thus constantly produced. Metastability and transduction thus provide Simondon with the terms of a *general ecology* of relations. This allows us to assert an ecology of becoming that is not structured by an opposition of organic and inorganic but that remains sensitive to differences of scale (i.e. molecular and molar). In my reading of *The Crystal World*, I draw on Deleuze's notion of 'crystalline narration' and show some of the aesthetic implications of Simondon's theory of becoming as transduction. I suggest that it is possible to view space and time as elements of a preindividual field, which perceptions and sensations individuate or formalise.

4. Ballard, Deleuze, and Crystalline Narration

Ballard's text begins with Powers, a doctor from a leper hospital, making his way by river steamer towards the town of Mont Royal, located amongst forest and jungle in the Cameroon. Mont Royal is the site of a French-owned mining settlement steeped in an atmosphere of colonial violence. Ballard refers to an 'abortive coup' by rebels to take over the diamond mines (Ballard 2011, 12). Powers' motives are from the outset described as 'ambiguous' and obscure even to him, but are related to a married woman, Suzanne Clair, with whom he has had an affair and who is now stationed at a clinic near Mont Royal. Sanders carries with him an enigmatic letter from Suzanne that obliquely references the crystallisation process:

The forest is the most beautiful in Africa, a house of jewels. I can barely find words to describe our wonder each morning as we look out across the slopes, still half-hidden by the mist but glistening like St. Sophia, each bough a jewelled semi-dome. Indeed, Max says I am becoming excessively Byzantine—I wear my hair to my waist even at the clinic, and affect a melancholy expression, although in fact for the first time in many years my heart sings! (18)

The irony of Ballard's spectacle of crystallisation—in which a whole European tradition of art and architecture seems to recapitulate itself in the West African landscape—is that an art historical framework is used to indicate a process whereby time is consumed by a metastasizing anti-time. This is not indicative of a mere loss of history to the atemporality of the image, as a Jamesonian reading would have it, but of a new discovery of time beyond the historical dead end of the 20th century, during which European religious and aesthetics traditions culminated in the bloodshed or war

and imperialism. The crystal thus *reclaims time* from an exhausted European tradition. Sanders suggests at one point that the appeal of baroque design is that it contains

a greater ambient time, providing that unmistakable premonition of immortality sensed within St. Peter's or the palace at Nymphenburg. By contrast, the architecture of the twentieth century, characteristically one of rectangular unornamented façades, of simple Euclidean space and time, was that of the New World, confident of its firm footing in the future and indifferent to those pangs of mortality which haunted the mind of old Europe. (148)

If the tradition of European (Christian) art and architecture culminates in the 'Euclidean' spacetime of a 20th century spatiality overly confident in its own future, then crystallisation stages an apocalyptic synthesis of the past with the present that offers us a new spatiotemporal reality. As the priest Balthus tells Sanders as the crystallisation of the forest nears completion: 'In this forest we see the final celebration of the Eucharist of Christ's body. Here everything is transfigured and illuminated, joined together in the last marriage of space and time' (162). Ideas of Christian eschatology, Romantic sublime, and psychological self-realisation all suggest themselves in this union with the forest. But by drawing on Simondon's use of the crystal as an ecological paradigm, we can read the novel as in terms of a suspension of the biological metaphor. Inorganic life becomes perceptible only through a crisis of the organic. For Ballard, as for the scientists and philosophers discussed above, the crystal suggests an ambiguous point on the threshold of the

living and the non-living. This is what links the crystal to the leprosy virus which, as Sanders puts it in a letter to a colleague, leads a 'semi-animate, crystalline existence, half in and half out of our own time-stream' (84). The crystal forest is a vision of the world seen according to the same uncertain state that characterises the life of the virus.

Corresponding to this apocalypse of the organic is a crisis of action and perception. Ballard's narrative is structured around a central opacity of motivation: Sanders can never articulate fully *why* he wants a union with the forest except in terms of a paralyzing fascination. While this is typical of a Ballard narrative, we can relate it to what Deleuze has called 'crystalline narration'. In his comparison of cinema before and after the Second World War, Deleuze noted a new propensity for what he called 'time-images' in the work of Orson Welles, Italian neo-realism, and the French New Wave. Such images, he argues, break with action and traditional narrative continuity. He relates this to the violence of the War and 'a shattering of the sensory-motor schema ... which had linked perceptions, affections and actions', but also to Bergson, for whom time is a distinct domain independent of matter and movement. This autonomy of time justifies the conception of an *élan vital* by which life is irreducible to matter. In Deleuze's reading, this leads less towards mysticism than a new understanding of time adequate to a new (20th century) awareness of spatiality because it allows us to think the actuality of matter and movement alongside a virtuality with which it coexists. Every image of the actual as being-present is accompanied by images of the virtual as a 'pure past', a temporality that is never actualised *as* present but always accompanies the present as its condition of possibility. The present passes only because it has a past to pass into. Post-War cinema, by breaking with action and narrative continuity, gives us a direct image of

time as the coexistence of past and present. Deleuze, drawing on Simondon alongside Bergson, discerns a class of cinematic images that he calls a ‘crystal images’, in which actual and virtual spacetimes are shown as coexisting:

Time consists of this split, and it is this, it is time, that we *see in the crystal*. ...

In fact the crystal constantly exchanges the two distinct images which constitute it, the actual image of the present which passes and the virtual image of the past which is preserved: distinct and yet indiscernible, and all the more indiscernible because distinct, because we do not know which is one and which is the other. (Deleuze 1989, 81)

In Simondonian terms, the present the image gives us is an individuation of a state of affairs, but there are also images of *preindividual* states that both co-exist with and condition the process of individuation. This is what Deleuze sees in certain examples of post-War cinema—such as the hall of mirrors scene in Welles’ *The Lady from Shanghai* (1948)—but the obsessively multiplied images of crystallisation in Ballard’s novel are also crystal-images in this sense because they combine states of the past (a worn-out European aesthetic tradition) with a present actualisation in which the possibility of action as temporal continuity (the sensory-motor schema) is leaking out of the universe. Ballard’s crystal images figure a catastrophic shattering of organic time precisely by illuminating a living present insusceptible to temporal continuity, action, or resolution. For Deleuze, post-War cinema likewise shatters the temporality of action and plot and he argues that we can, as a result, oppose ‘organic narration’ to ‘crystalline narration’. While the former ‘consists of the development of

sensory-motor schemata as a result of which the characters react to situations or act in such a way as to disclose the situation', crystalline narrative

implies a collapse of sensory-motor schemata. Sensory-motor situations have given way to pure optical and sound situations to which characters, who have become seers, cannot or will not react, so great is their need to 'see' properly what there is in the situation. (128)

Crystalline narrative works not by the continuity of lived experience but by shattering Euclidean spacetime. Concrete space thus 'ceases to be organized according to tensions and resolutions of tension, according to goals, obstacles, means, or even detours' (128-9). Ballard's novel does, certainly, contain goals, obstacles and so forth, but these ultimately exist only to document a transition from the organic to the crystalline regime, from action to 'seeing'.

Ballard's final instalment in his tetralogy, then, is a narrative whose dynamics mirror the materiality of the ecological catastrophe itself. Crystallisation suspends organic time through a series of proliferating images of entropic stasis, but entropy here should not be understood as the end of all novelty. Rather, by suspending the organic time of action, Ballard suggests a reclamation of time from the dead end of 20th century history, whose terminal point is the Euclidean spacetime of modern architecture. The narrative plunders Western art history in order to offer up an ecoapocalyptic vision of a new spacetime. The ecology of the crystal thus leads us beyond the antinomies of nature and culture, organic and inorganic, vital and technological. For Ballard, these antinomies become sites of antagonism and generate a crisis of spatiality in which inner or psychic space appears in the form of an external

reality shaped by libidinal and technological impulses. This is the terrain of his great urban dystopias of the 1970s, in which media images take on a deathly and seductive role, displacing the element of ecological transformation. Nevertheless, the dystopianism of novels such as *The Atrocity Exhibition* and *Crash* may best be understood in relation to the earlier ecoapocalypses, and *The Crystal World* in particular.

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